



Centers for Disease Control  
and Prevention (CDC)  
Atlanta GA 30333

March 31, 2014

The Honorable John D. Rockefeller IV  
United States Senate  
Washington, DC 20510

Dear Senator Rockefeller:

Thank you for your letter regarding the continued concerns that you and West Virginia citizens have about the current safety of the drinking water and the potential health effects related to the West Virginia Elk River 4-methylcyclohexanemethanol (MCHM) release.

Enclosed please find the Centers for Disease Control and Prevention's (CDC) response to your request for more information on the factors we used to determine that long-term health effects are unlikely, as well as our analysis of the effects of the chemicals in this spill on the air in the area. We understand that the Environmental Protection Agency will be sending a separate response.

Thank you again for your letter and for your support in this response. If you or your staff have any further questions, please contact Barbara Rogers in the CDC Washington Office at (202) 245-0600 or [brogers@cdc.gov](mailto:brogers@cdc.gov). We hope that you find this information helpful.

Sincerely,

Thomas R. Frieden, MD, MPH  
Director, CDC, and  
Administrator, Agency for Toxic Substances  
and Disease Registry

Enclosure

## Detailed Responses to Senator Rockefeller's February 21, 2014, Inquiry

### Long-term Health Effects

On the basis of what we know about the chemicals involved, the duration of any exposures, and the water sampling data that we have reviewed, we do not believe that long-term health effects related to this event are likely. More specifically, the factors supporting this determination include the following observations:

- **Chemicals Involved:** Although there is limited available toxicological information on 4-methylcyclohexanemethanol (MCHM) and propylene glycol phenyl ether (PPH), the animal data we have and the chemical structure suggest relatively low toxicity. The short-term screening levels for MCHM and PPH were developed from a No-Observed-Adverse-Effect Levels (NOAEL) approach. Applying the animal NOAEL provided a very conservative assessment method for potential human health effects.
- **Duration of Exposures:** There is essentially no toxicological data in the existing literature on the long-term health effects of these chemicals; however, the likelihood of any long-term health effects is low because exposures were of very short duration, and the levels of exposure generally were lower than the short-term screening levels. The “do not use” order for water was issued within a few hours of the spill, and we believe compliance was high because of the smell.
- **Water Sampling Data:** The short-term drinking water screening level the Centers for Disease Control and Prevention (CDC) established for MCHM is 1 part per million (1 ppm or 1000 parts per billion [ppb]). As stated in the “Summary Report of Short-term Screening Level Calculation and Analysis of Available Animal Studies for MCHM,” a level of 1 ppm or below is not likely to be associated with any adverse health effects. Few studies of the health effects of MCHM have been conducted, and most of those have been in animals. CDC scientists used the limited information from those studies to estimate how much MCHM a person could ingest without experiencing adverse health effects. Using a widely accepted and commonly used approach in public health and risk assessment, CDC calculated this level by extrapolating from the available animal toxicity studies. The calculation used uncertainty factors to take into account the differences between animals and people, and to consider possible effects on vulnerable populations, including pregnant women and children. Finally, an additional uncertainty factor was applied to account for the limited availability of data.

The highest MCHM water levels detected after the spill were in the 3000 ppb range; most early readings during the timeframe of the “do not use” order were in the 1000–2000 ppb range. The levels of MCHM dropped rapidly; water treatment plant readings were at “non-detect” very early on, and since then have remained below detection limits. Distribution system readings also dropped quickly. Readings above detection limits were generally in the 10–50 ppb range. As of March 3, 2014, the state has reported that MCHM in all water system samples is at “non-detect” levels, using an even lower limit of detection of 2 ppb.

The short-term drinking water screening level CDC established for PPH is 1.2 ppm (1200 ppb). As stated in the “Summary Report of Short-term Screening Level Calculation and Analysis of Available Animal Studies for Dipropylene Glycol Phenyl Ether (DiPPH) and Propylene Glycol Phenyl Ether (PPH),” a level of 1.2 ppm or below is not likely to be associated with any adverse health effects. The highest concentration of PPH detected in the public drinking water supply was 0.011 ppm (11 ppb).

Note: sampling was not started for PPH until January 23, 2014; the state was not notified about PPH until January 22, 2014, and reliable testing protocols had to be developed before testing could begin. At this time, retrospective analysis of previously stored water samples from the initial days of the incident and analysis of current water samples have been completed. The only detected value of PPH was found in a water sample from the public drinking water system on January 11, 2014, when the “do not use” order was still in effect.

We want to make sure that West Virginia’s health authorities are in the best position possible to answer any questions about potential health consequences. Therefore, CDC will continue to work with the West Virginia Department of Health and Human Resources to strengthen and use existing capacity (e.g., birth defects surveillance, cancer registries, and health system data) to expeditiously identify and track any potential population health effects.

#### Present and Potential Effects of MCHM and PPH in the Air

With current levels in finished water at “non-detect” levels, any detected levels in air would be extremely small and of no health concern. We evaluated the potential for developing an air-screening level but learned this may be difficult due to the lack of supporting toxicological information. We will continue to work with other federal partner agencies to explore whether an air-screening level is feasible.

It appears that humans can detect the odor of these chemicals even at very low levels (in the single digits ppb range). Although anecdotal media reports suggest some persons continue to complain of transient odors, our Epi-Aid team in West Virginia and health department staff have not noted any odors for several weeks now.

Reported odor complaints occasionally have been associated with water levels slightly above the laboratory limit of detection, but reportedly have cleared quickly with appropriate flushing of the system. Small amounts of residual chemical may be present in filters or in remote portions of the distribution system, if adequate flushing, filter changes, or both, have not been completed.

CDC/Agency for Toxic Substances and Disease Registry (ATSDR) has also consulted with colleagues in the occupational health field and in industry<sup>1</sup> about worker exposures to crude and pure MCHM. Formal studies have not been conducted, but we understand that long-term health concerns among coal-cleaning facility workers who specifically use this product have not been identified. We would expect these workers to encounter inhalation exposures at levels much

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<sup>1</sup> National Institute for Occupational Safety and Health, Occupational Safety and Health Administration, Mining Safety and Health Administration; Eastman

higher and for longer durations than the affected West Virginia residents, who may experience very low levels from residual contamination in their water pipes or plumbing.

### Epi-Aid

The Epi-Aid medical records review is still underway in close collaboration with West Virginia authorities, and we are working jointly with state health officials to release the results as quickly as possible.

In addition, CDC's National Center for Environmental Health/ATSDR Chief Medical Officer, Dr. Vikas Kapil, has been in regular communication with the West Virginia Commissioner and State Health Officer, Dr. Letitia Tierney. CDC/ATSDR is working with Commissioner Tierney to conduct a Community Assessment for Public Health Emergency Response as part of a follow-up Epi-Aid. This public health and emergency management survey uses scientific methods that can quickly provide public health officials with reliable information on the needs of the affected population and ways to assist in recovery and future preparedness activities.